

TORREYA

March, 1901

A NEW HORSE GENTIAN (TRIOSTEUM) COMMON IN THE EASTERN STATES

BY EUGENE P. BICKNELL

Notwithstanding that Rafinesque, in 1836, proposed six species of *Triosteum* in addition to the two which had come down from the time of Linnaeus, these two alone continue to represent the genus in our manuals of to-day. There is, nevertheless, a third species, quite a common one, which seems to have escaped recognition as effectually as if it did not exist. Its discovery, now some years ago, was quite a matter of accident, and affords a good illustration of the utility of botanical gardens in the study of our flora.

In the early days of the New York Botanical Garden, while passing through the grounds one Saturday afternoon in company with Dr. Britton, I rather surprised my companion by asking the name of a *Triosteum* cultivated in the herbaceous beds. My own surprise was in turn excited upon learning that the plant was merely the common *T. perfoliatum* L. and I insisted that it was, nevertheless, a species different from the plant with which I was familiar as *T. perfoliatum* and which actually grew in its native state on the grounds of my own home. The cultivated specimen had been brought from Staten Island, near Dr. Britton's home, and the following day an opportunity was found of visiting, under Dr. Britton's guidance, the very piece of woodland from which the plant had been removed. There, in its natural surroundings, we found more of it, and the interesting fact at once developed that it was distinctly later-flowering than the species of my own region twenty miles

[The exact date of publication of each issue of TORREYA is given in the succeeding number. Vol. 1, No. 2, comprising pages 13-24, was issued February 23, 1901.]

farther north along the Hudson River. The latter had come into bloom some two weeks before, whereas the flower-buds of this Staten Island plant were still very immature. I had never collected the species familiar to me, taking for granted—a cardinal sin in systematic botany—that it was our supposedly well-known *T. perfoliatum*, the only red-flowered species allowed by the books. Now, however, upon the first occasion, the two plants were carefully compared and it needed no profound study to find out that they were distinct species.

The essential or rather the most obvious difference between the two is seen in the main leaves which, broadly perfoliate in true *perfoliatum*, are in the new species conspicuously narrowed into a merely sessile base. This, however, holds true only of the principal sets of leaves. In the upper leaves a curious reversal of these characters is frequent. In *perfoliatum* the upper leaves are often, or usually, narrowly sessile; in the contrasted plant they are sometimes distinctly connate.

Just here is encountered a difficulty which I have found insuperable in attempting the correlation of any of Rafinesque's descriptions with the present new plant. Parts of most of these descriptions seem to point toward it; other parts seem to have a different bearing. It would appear that Rafinesque must have had the species but there is no certainty in regard to this nor as to the positive application of any of his names. Those which do not refer unmistakably to *Triosteum perfoliatum* or to *T. angustifolium* may refer, for anything which appears to the contrary, either to forms or fragments of *T. perfoliatum*, or to species as yet unknown. In going over the matter with Dr. Britton, we have been able to reach no other conclusion than this. The case seems analogous to that of the genus *Lechea*, about which Rafinesque knew a great deal in a careless and incoherent way or, at least, so set down what he knew, making his descriptions veritable enigmas to us at the present day.

Triosteum aurantiacum sp. nov.—Stem 5–12 dm. tall, glandular-puberulent to weakly hirsute, simple and erect or late in the season sometimes declined: leaves thin, entire or rarely subsinuate, becoming 1.5–2.5 dm. long and 8–10 cm. wide, ovate-oblong to oblong-lanceolate, acute, attenuate at both ends,

or acuminate at the apex and contracted below the middle into a narrow basal portion, sometimes, especially in the upper leaves, the extreme base again slightly dilated and connate, but never broadly perfoliate, green and thinly appressed-hirsutulous above, scarcely paler beneath, except in age, and minutely soft-pubescent: corolla dull purplish-red, 14–20 mm. long, the outer surface glandular-puberulent, strongly gibbous-saccate at base, more distinctly two-lipped and dilated above and with larger more spreading lobes than in *T. perfoliatum*, the stamens relatively much shorter and the style less exerted; calyx-lobes linear, obtuse, the largest becoming 18 mm. long and much surpassing the corolla; fruit 2–6 in each pair of axils, larger and more obovoid-oblong than in *T. perfoliatum*, pubescent, becoming orange to bright orange-red.

From Quebec to Minnesota, Massachusetts, North Carolina, Kentucky and Iowa, growing in rich soil in hilly or rocky woods. Comes into flower about New York from May 9 to 20, two or three weeks earlier than *T. perfoliatum*. The fruit ripens in late summer and sometimes persists well into November.

The type from Van Cortlandt Park, New York City, is deposited in the herbarium of the New York Botanical Garden.

This plant, although greatly resembling *T. perfoliatum*, has many points of difference. Perhaps the most obvious of these results from the shorter internodes of *T. perfoliatum* and its broadly perfoliate leaves which sometimes measure as much as 5–7 cm. across their united bases. *T. perfoliatum* is also mostly stouter and more leafy, the leaves thicker, and more rugose-veiny and paler beneath and more densely soft-pubescent. A closer comparison reveals interesting differences between the flowers of the two species. Not only is the corolla of *T. perfoliatum* often duller in color and decidedly greenish about its lower half, but it is markedly different in shape and in relatively longer stamens and more exerted style; the corolla-tube is nearly cylindrical and scarcely at all two-lipped with very short erect lobes scarcely, if at all, surpassing the anthers, in definite contrast with that of *T. aurantiacum*, which is decidedly two-lipped and upwardly dilated with much larger more or less spreading lobes much surpassing the included stamens. Furthermore, the calyx segments of *Triosteum perfoliatum* are ordinarily much shorter and less foli-

aceous than in *T. aurantiacum* and usually narrower and more acute. The fruit of *T. perfoliatum* is commonly more numerous and crowded than in *T. aurantiacum*, mostly 6-8 in each pair of axils, more globose and of a duller yellowish-orange color; at least, I have never seen it of as deep a flame color as that of *T. aurantiacum* sometimes becomes. Apparently also the species prefers a more sandy soil in lower, more level woods and thickets.

I have been unable to make out much difference in the distribution of the two species, although *T. perfoliatum* is perhaps rather more southern in its range. Specimens seen show a range from New York to Minnesota, Alabama, Kentucky and Kansas.

A MODIFIED FORM OF RESPIRATION APPARATUS

BY H. M. RICHARDS

There are many methods of all degrees of complication by which the amount of carbon dioxide evolved by plants may be measured. Many are simply out of the question for a laboratory which is not extensively stocked, requiring as they do a great array of glassware, many air-tight joints, siphons, aspirators or what not, while others are very crude. The writer has found the following simple and easily constructed piece of apparatus very useful for demonstrating in a fairly accurate way and on a somewhat large scale the respiration of plants. It is indeed a modification in form but not in principle of a method long used and often figured in many of the text-books. The apparatus referred to consists, as far as the glassware is concerned, of an exceedingly long-necked flask. Such flasks, however, must be specially blown and are consequently hard to obtain and also somewhat expensive. Instead of such a flask, an ordinary Bohemian one of 150 to 200 cc. capacity, with the neck of usual length, is selected. A test-tube, the closed and slightly tapering end of which was just a little too large to slip into the flask's neck, is next taken. By means of a little carborundum or emery-powder it is ground into the flask neck so as to get an air-tight closure like that of the glass stopper in a bottle.